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## IN RE ADOLF MLOT-FIJALKOWSKI

Appeal No. 81-597

## UNITED STATES COURT OF CUSTOMS AND PATENT APPEALS

676 F.2d 666; 1982 CCPA LEXIS 156; 213 U.S.P.Q. (BNA) 713

Oral argument on February 2, 1982

April 15, 1982

**PRIOR HISTORY: [\*\*1]**

Serial No. 818,444

**COUNSEL:***Otto R. Krause*, of Chicago, Ill., attorney for appellant.*Joseph F. Nakamura*, Solicitor, and *Henry W. Tarring, II*, Associate Solicitor, of Washington, D.C., attorneys for the Patent and Trademark Office.**OPINIONBY:**

MARKEY

**OPINION: [\*666]**

Before MARKEY, Chief Judge, RICH, BALDWIN, MILLER, and NIES, Associate Judges.

MARKEY, Chief Judge.

This is an appeal from a decision of the Patent and Trademark Office (PTO) Board of Appeals (board) sustaining the examiner's rejection of claims 1-13 in application serial No. 818,444, filed July 25, 1977, entitled "Visible Dye Penetrant System," as obvious under 35 USC 103 in view of Sockman et al. (Sockman) n1 combined with either Vincent et al. (Vincent) n2 or Skelly et al. (Skelly). n3 We affirm.

n1 United States Patent No. 2,667,070, issued January 26, 1954.

n2 United States Patent No. 3,906,123, issued September 16, 1975.

n3 United States Patent No. 4,021,059, issued May 3, 1977.

**BACKGROUND***The Invention [\*\*2]*

Appellant claims an improvement in the art of non-destructive testing of workpieces for surface discontinuities using dye penetrants. The basic prior art process includes four steps: (1) a liquid penetrant, typically a visible dye in a penetrating oil, is applied [\*667] to the surface to be tested where it migrates into and becomes lodged in flaws open to the surface; (2) excess penetrant is removed; (3) a developer suspension is applied, which absorbs the penetrant entrapped in flaws and provides a contrasting background to the exuding dye indications; and (4) inspection under visible or fluorescent light, depending on whether a visible or fluorescent dye was employed, to locate discontinuities. These steps are illustrated in the following figures taken from appellant's brief:

[See Illustration in Original]

Appellant's invention substitutes for the prior art penetrant one containing a compound, which, initially either colorless or only slightly colored, undergoes a color-forming or color-intensifying reaction *in situ* with the solid particles of the developer. The following are the appellant's independent claims:

1. In the method of testing a solid object [\*\*3] for surface discontinuities in which a liquid penetrant is applied to the surface to be tested, excess penetrant is removed, and a non-aqueous developer suspension of solid particles is applied to the surface to absorb penetrant which has become lodged in surface discontinuities, the improvement which comprises using a penetrant in which there is dissolved a compound which undergoes a color-forming reaction with said solid particles in said developer suspension so that said penetrant undergoes a distinct color change upon being contracted with said developer suspension, said color change making it possible to de-

fect surface discontinuities in which said penetrant was lodged.

2. The method of testing a solid object for surface discontinuities which comprises applying to said surface a penetrant composition containing a dye dissolved therein which undergoes a color change upon contact with clay particles, removing excess penetrant while leaving penetrant entrapped in surface flaws, applying a developer comprising clay particles in a non-aqueous liquid over the surface to initiate a color-intensifying reaction between the entrapped penetrant and the clay particles and thereafter inspecting [\*\*4] the surface under visible light to determine the location of visible color sites produced by such reaction. n4

n4 Appellant has not argued the patentability of the dependent claims separately from independent claims 1 and 2 and, accordingly, the former are treated as standing or falling with the latter. *In re Wiechert*, 54 CCPA 957, 370 F.2d 927, 152 USPQ 247 (1967); *In re LeBaron*, 42 CCPA 956, 223 F.2d 471, 106 USPQ 176 (1955). The independent claims broadly describe the basic Sockman inspection process, but substitute "a compound which undergoes a color-forming reaction" (claim 1) or "a dye... which undergoes a color change" (claim 2) for Sockman's initially visible dyes. The developers are not distinguished in the claims, being described only as non-aqueous suspensions of solid (claim 1) or clay (claim 2) particles.

The following figures are derived from appellant's specification: [\*668] [See Illustration in Original]

Appellant contends that the color reaction at the site of the flaw results [\*\*5] in advantages over the prior art in that the dye indications are more vivid, and, unlike the prior art indications, which allegedly continue to exude and bleed into the developer, becoming indistinct, appellant's indications are immobilized. Appellant states in his specification that it had been "virtually impossible to make a permanent record of the flaw indications" in the prior art, but that his invention's color reaction, by fixing the color directly at the site of the flaw, makes a permanent record possible "by lifting the dyed indication off the surface of the piece through a pressure sensitive cellophane tape or the like."

Appellant discloses that "particularly preferred dyes included in the penetrant are [\*669] water insoluble monoazo dyes" and that "materials such as crystal violet lactone or benzoyl leuco methylethene blue provide blue colors when reacted with clay type materials," and that "[s]uitable clays include bentonite clay, attapulgis clay

and kaolin clay."

#### *Prior Art*

Sockman discloses a method for surface flaw inspection of the penetrant-developer type, wherein the penetrant contains a visible dye. He describes alizarin base red dye as highly satisfactory [\*\*6] but states that "many other dye types and colors can be used" and that "the developer material can be any finely divided material... [p]recipitated chalks, zinc oxide or both have been found satisfactory."

Sockman discloses that a permanent record of an inspection can be produced by photographing the stained developer coating or preferably by picking up the coating with transparent adhesive tape and then applying it to a record sheet.

Vincent and Skelly broadly disclose reactions of color formers or dye intermediates with clay developer particles to produce colored images. Both patents focus on the adaptation of those reactions in the duplicating paper art, but are not limited thereto. Vincent discloses that the chromogenic substance may be coated on substrates other than paper "such as plastic and fabric or textile webs," and Skelly discloses that the carrier material "impregnated with the colour former solution may be fabric."

Vincent states: "Pressure-sensitive marking systems are well-known which involve localized contact between a chromogenic compound, such as crystal violet lactone and benzoyl leuco methylene blue, and a color-developing substance, such as acid-treated [\*\*7] clay, to produce a colored marking on paper or the like." Skelly notes that "[i]n particular, azoic colour formers... can be used."

Vincent discloses that the particulate material may include "bentonite, kaolin, acidic clays, talc, aluminum silicate,..., metal oxides, metal chlorides or the like. Such materials are well-known in the art." He specifically points out that a preferred clay developer contains zinc oxide. Skelly indicates that the "colour former activating substance... may be, for example, attapulgit, bentonite, silica,... kaolin or any acidic or acidified clay."

#### *Board Decision*

In sustaining the examiner's rejection of all the appellant's claims, the board stated:

An essential feature of any penetrant inspection system is the selection of a highly visible, stable dye that is capable of providing a permanent record. We find it reasonable to presume that the inventor, when confronted with a problem in selecting the appropriate dye system, would have the ability to select and utilize knowledge

from the pertinent related dye arts and, hence, we hold that the Skelly and Vincent references are from an analogous art.

The board found that "the concepts [\*\*8] fairly contained in the examiner's references... would suggest to one skilled in the art... [the] substitution of the color former-activator systems of either Skelly or Vincent into the process of Sockman."

#### Issue

Would appellant's invention have been obvious under 35 USC 103 in view of Sockman and either Vincent or Skelly?

#### OPINION

Appellant argues that the art of flaw detection represented by Sockman is not analogous to image creation in the art of duplicating type papers represented by Vincent and Skelly. n5 We are unpersuaded by [\*670] this argument, considering its focus misplaced on the remoteness of the specific applications of the underlying dye chemistry rather than on the dye chemistry reactions themselves. n6

n5 The dissent's footnote 1 is an attempt to support this argument by comparing the PTQ classification and field of search for Sockman with those for Vincent and Skelly. Such classification evidence, even when properly of record, is of limited value. As we said in *In re Ellis*, 476 F.2d 1370, 1372, 177 USPQ 526, 527 (CCPA 1973):

While we find the diverse Patent Office classification of the references to be *some* evidence of "non-analogy," and likewise find the cross-reference in the official search notes to be *some* evidence of "analogy," we consider the similarities and differences in structure and function of the inventions disclosed in the references to carry far greater weight.

Such evidence is inherently weak also, because considerations in forming a classification system differ from those relating to a person of ordinary skill seeking solution for a particular problem.

Except for some of the class and subclass numbers, the material in footnote 1 of the dissent appears nowhere in the record made in the Patent and Trademark Office in this case.

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n6 That the flaw inspection art throughout its history has been deeply involved with dye chem-

istry problems is evident from the content of earlier litigation concerning the Sockman patent. *Switzer v. Watson*, 183 F. Supp. 467, 125 USPQ 48 (D.D.C. 1960). Given the complexity of dye chemistry problems associated with the flaw inspection art, it would appear that applied dye chemistry would be the appropriate source to which to look for their solution.

Sockman, Vincent and Skelly are related in that they all disclose the use of dyes and finely divided developer materials to produce colored images. One of the developers disclosed by Sockman as satisfactory, zinc oxide, is also disclosed as a developer component in Vincent.

"The prior art that is relevant in evaluating a claim of obviousness is defined by the nature of the problem confronting the would-be inventor." *Republic Industries, Inc. v. Schlage Lock Co.*, 592 F.2d 963, 975, 200 USPQ 769, 781 (7th Cir. 1979). According to the appellant, the problem he confronted was the "enhancement and immobilization of dye penetrant indications." [\*\*10] That problem is one of dye chemistry, and a search for its solution would not be limited to the field of dye penetrant inspection but would include the dye arts in general.

Appellant asserts that Sockman's "picked-up indications are not permanent records" as they "are blurred in a short time" because "the dye penetrant is in no way immobilized and continues to exude, even into the adhesive backing of the cellophane tape." Vincent and Skelly are reasonably pertinent to that problem in that they both concern the production of clear and permanent records of colored images.

Vincent and Skelly also suggest a solution to the second facet of the appellant's asserted problem — the "enhancement of... dye penetrant indications." Vincent's example 1 discloses a "blue image of high intensity," and Skelly's example 9 discloses a "strong red colour."

We agree with the board's finding that the "pertinent related dye arts" are analogous to the penetrant inspection art for the purpose of selecting a suitable dye system, and conclude that Vincent and Skelly meet the test for analogous art of *In re Wood*, 599 F.2d 1032, 1036, 202 USPQ 171, 174 (CCPA 1979) in that they are "reasonably pertinent [\*\*11] to the particular problem with which the inventor was involved."

Sockman suggests that dyes other than those specifically disclosed could be substituted in his process and notes that "[m]any types of penetrants have heretofore been used to locate flaws or discontinuities in metallic or nonmetallic surfaces" and further that "[v]arious indications, dyes, couplers, and fluorescent mixtures have been

added to the penetrant to increase the visibility of the seepage." Given appellant's problem, it would have been obvious for one of ordinary skill to employ the color forming or intensifying systems taught by Vincent or Skelly in the technique taught by Sockman. Forming or intensifying color *in situ*, as do Vincent and Skelly, rather than using visible dyes as Sockman does, would have been an obvious matter of choice.

Accordingly, the decision of the board is *affirmed*.

**AFFIRMED**

**DISSENTBY:**

MILLER

**DISSENT:**

MILLER, J., with whom BALDWIN, J., joins, dissenting.

As the board said, "The real issue is the obviousness of using these known color [\*671] forming compounds [disclosed by Skelly and Vincent in their image producing systems] in the Sockman process and activating [\*\*12] them during application of the developer."

Sockman, of course, has to do with a penetrant-developer flaw inspection technique wherein the penetrant contains a visible dye. Although this reference appears to come within appellant's field of endeavor, there is no suggestion for forming or intensifying color *in situ*, but merely a teaching that alizarin base red dye is highly satisfactory, although "many other dye types and colors can be used." To render obvious appellant's *in situ* technique, the majority opinion relies upon Skelly and Vincent, concluding that these secondary references are "reasonably pertinent" to appellant's (and Sockman's) problem of "enhancement of... dye penetrant indications" because the

problem is one of "dye chemistry"; further, that a search for its solution "would include the dye arts in general." I cannot agree that this broad (almost infinite) basis for the conclusion on pertinent art meets the test of *In re Wood*, cited in the majority opinion, and *In re Antle*, 58 CCPA 1382, 1387, 444 F.2d 1168, 1171-72, 170 USPQ 285, 287-88 (1971). Rather, considering the subject matter as a whole, of Skelly and Vincent, which are directed to the [\*\*13] carbonless copy and image producing arts using paper, plastic, fabric, or textile webs, those references relate to a different environment from the dye solution flaw inspection art n1 and cannot properly be held to be from art analogous to that of Sockman, whose invention "is particularly valuable for the inspection of case welded, or forged metal parts prior to use during which the metal part is subject to high stresses." Furthermore, I am not convinced that the color formers of Skelly and Vincent (which are essentially colorless until contacted with a developer) are "dyes" within the common meaning of that term and within the contemplation of Sockman. Likewise, the carbonless copy and image producing arts would not seem to be part of the "dye arts in general."

n1 The difference in environment is shown by the PTO classifications designated for each of the references. Although not binding on this court, such a showing supports a conclusion that Skelly and Vincent are not from art analogous to that of Sockman. See *In re Ellis*, 476 F.2d 1370, 177 USPQ 526 (CCPA 1973). The Skelly and Vincent classifications are shown on the faces of those patents. The current Sockman classifications, although proper subject matter for judicial notice (readily verifiable facts not subject to reasonable dispute), were made of record by the Solicitor at the request of the court without objection by either party.

U.S. Classification

Class	Subclass	Relevant Description (from PTO Classification Manual)
Sockman		
* 73	104	MEASURING & TESTING; Surface and cutting edge testing
35	50	EDUCATION; Article and surface demonstration, intercomparison
252	408	COMPOSITIONS; Analytical, testing or indicating compositions
346	1	RECORDERS; Processes
	134	Record receivers
Skelly		
* 282	27.5	MANIFOLDING; Leaves; Impressible

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Class	Subclass	Relevant Description (from PTO Classification Manual)
		mark forming (carbonless transfer system)
106	14.5	COATING OR PLASTIC COMPOSITIONS; Hectographic or copying
427	150, 151	COATING PROCESSES; Transfer or copy sheet making, Reactive components
428	261, 288 411, 537	Nonuniform coating STOCK MATERIAL; Nonstructural laminate, Of wood or paper
	914	Transfer or decalcomania
Vincent * 427	145	COATING PROCESSES; Latent image formed or developed
	150	Transfer or copy sheet making, Reactive components
428	411	STOCK MATERIAL; Nonstructural laminate

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\* Primary Classification.

The board's holding that the Skelly and Vincent ref-

erences are from analogous art (to that of appellant and Sockman) is premised on its conclusory statement that they are "from the pertinent related dye [\*672] arts." This does not establish a prima facie case of obviousness in the face of what is disclosed *in the record before this court*.